ment of substances containing oxygen is a part of our ordinary materia medica, and there is no fear (*e.g.*) that any hunter will lead the profession, like inexperienced hounds, "off the scent," by assertions regarding the fumes of perchloric acid and nitric acid conveying pure oxygen to the lungs by inhalation. As to inhalation, undiluted oxygen may be, and is, exceptionally useful; but, as a rule, it affords but little satisfaction, even if it does no harm. In desperate cases, as a last resource, I have tried the undiluted, after the gradually less-and-less diluted gas had failed. For one or two minutes it has seemed to revive the patient; but the transient reaction has generally been followed by an immediate return and even increase of depression. It is necessary that the atoms of oxygen should be distributed through some medium; and atmospheric air is naturally selected as the best and most convenient, though nitrogen would almost equally subserve; and in some cases a medium of hydrogen (very carefully managed) affords a special advantage. For doses I would direct the reader to remarks, interspersed among the illustrative cases afterwards, to my paper of 1859, and to my monograph, *The Use of Oxygen in Disease*, published in 1857, a new edition of which will shortly appear. The precise method of inhalation is highly important. In bad cases the inhalations (for a time, at least, at the outset of treatment) ought to be carefully watched by the practitioner. According to the special condition of the lungs, heart, brain, etc., or the patient's physical weakness or possible nervousness, so ought the depth and vigour of the inspirations, and duration of each sitting, to be regulated. The diluted oxygen should be retained in the lungs for at least two seconds. A medium period is five to six seconds after an ordinary inspiration of (say) from 70 to 150 cubic inches, according to pulmonary capacity. One minute's interval of ordinary respiration, at least, should elapse between each artificial inspiration; and in some cases—either sensitive to its effects, or soon fatigued through debility—from two to four minutes' interval, ought to take place. As a rule, one well-managed half to three-quarters of an hour's sitting in the twenty-four hours is much more beneficial than short and repeated sittings; but of course there are exceptions. It is not desirable, as a rule, to take it either after long fasting, or soon after a good meal. During the sitting all excitement should be prohibited; but after its completion active movement for a few minutes in the room, or a little exercise in the open air, is advantageous. From foregoing observations, it will be obvious that chilliness and cold feet must be guarded against, as far as possible, during the inhalations.

To conclude this portion of our subject with a slight summary. As atmospheric air is provided for us by Infinite Wisdom as the perfect respiratory medium physiologically considered; so physiological experiments point to its physiological relations, and materially assist towards a comprehensive view of artificially-prepared oxygen as a curative agent. But, on the other hand, artificially-prepared oxygen can only be thoroughly tested in its own plane; being a remedy demanded by perverted physiology, its true value can only be understood through pathology. Thus it can be clinically tested by its action through the lungs, stomach, and skin; but, in testing it, we must recognise practically—1, heat, polarisation, motive power, associated with the oxygen atom; 2, the same forces in the living organism; 3, the mutual relations of these forces, inorganic and organic, in connection with individual constitution and various perversions from the healthy standard, as well as under medicinal modification.

THE LATE DR. LESLIE.—The Buenos Ayres papers report the death of Dr. Leslie, a gentleman well known there for the benevolent zeal with which he made his scientific knowledge contribute to the well-being of those about him. In April last his wife returned to England, after an absence of eighteen years, her main object being to place their children at school, and a subsidiary one being to have some intercourse with friends from whom she had been separated so long. The sudden intelligence of her husband's death made her almost mad. She learns that the district in which she left him has been visited by cholera; that great numbers of men, women, aud children have been stricken with the hateful disease, and that the doctor, caring only for those who were suffering, gave himself, night and day, to the services required of him as a medical man. On the 13th of January last he was himself attacked. The news spread rapidly through the entire district, and crowds of people, rich and poor, jostling together at the door, made eager inquiries as to the chance of so valuable a life being spared. He died the same day, and was buried on the following morning. The Buenos Ayres papers report that he not only attended the poor zealously without fee, but that very frequently he supplemented his proper work of a doctor by giving money, food, and clothing wherever he found a family in want. Mrs. Leslie has already left England to visit the grave of her husband.

ON THE NITROUS OXIDE GAS AS AN ANÆSTHETIC.

BY J. MARION SIMS, M.D.,
Honorary Fellow of the Obstetrical Society of London; late Surgeon of the Women's Hospital, New York.

[With a Note by Dr. J. THIERRY-MIEG.]

I AM glad to see that the subject of nitrous oxide anæsthesia is now prominently before the profession in England; and I wish to lay my brief experience with it before my brethren.

In December 1867, Mrs. P. came to Paris from St. Louis, Missouri, to have her breast amputated. She was fifty years old. The tumour, occupying the left mamma, had been growing for two years, and was about the size of a man's head. Two large deep sloughs on its surface gave issue to a profuse ichorous sanies, and she was failing rapidly. Drs. Evans and Colton administered the nitrous oxide gas on December 22nd; and I amputated the breast, and then united the edges of the incisions by sixteen interrupted silver sutures. The operation and dressing occupied sixteen minutes; and during all this time the patient was kept under the influence of the anæsthetic. She recovered readily from its effects, without nausea, headache, or any other unpleasant symptom. I had the assistance of Sir Joseph Olliffe, Baron Larrey, Professor Pope of St. Louis, Dr. Johnston, and many others, all of whom expressed themselves perfectly satisfied with its action.

On the 28th of December last, Drs. Evans and Colton gave the gas to Miss X., of Dublin, aged 38, who has been living in France for eleven years. While residing in Dublin, she had some disease of the lungs, for which Professor Stokes ordered her to the continent. She supposed herself cured of her lung-disease, and I was consulted for an abdominal tumour, which had been growing for the last three or four years. Dr. Maisonneuve had seen her, and there was some doubt about the real nature of the disease. To determine whether it was fibroid or cystic, I suggested the propriety of giving her chloroform, as she was too nervous to bear the necessary manipulation without an anæsthetic; but she objected, on account of some heart-disease, saying that she had taken chloroform once, and Dr. Stokes had warned her never to take it again. Dr. Pratt examined her heart, and found that she really had organic valvular disease. With these facts before us, and with the warning of Dr. Stokes, we did not dare to give her chloroform. I mentioned this case to Dr. Colton; and he said he was not afraid to give the gas where there was only disease of the heart, but that he thought there was some risk in confirmed cases of consumption with a tendency to hæmorrhage. On the 28th of December last, Drs. Evans and Colton administered the gas to Miss X.; and she was kept fully under its influence for eight minutes. She promptly recovered from its effects; but on the following day she had a slight exudation of blood from the ears, the nose, and the throat. She had a little bloody expectoration for more than twenty-four hours. She says that the immediate effects of the gas were very disagreeable; for she felt as if the blood would burst forth from her ears as soon as she commenced to inhale it.

A stout healthy-looking woman (a native of Italy), the mother of two children, had an indurated fissured knobby tumour of the umbilicus about the size of an English walnut. It was seen by Mr. Nélaton in September 1866, and he pronounced the disease cancerous. He advised her against any surgical operation, saying that the wound of the peritoneum necessary for the removal of the tumour might produce fatal peritonitis.

I saw this case soon after Mr. Nélaton, and concluded to try Dr. Broadbent's treatment by acetic acid injection. This was practised from time to time for six months, and the tumour gradually diminished to about one-fourth of its original size. It lost its deep purple appearance and seemed to shrink down to a small mass of fibrous structure, but it retained its fissured knobby appearance and its lancinating pains. Six months ago I abandoned all hope of curing it by this means, and the operation was determined upon.

On the 2nd of this month, Dr. Crane, a young American dentist of Paris, gave the gas, and I extirpated the tumour. I expected to finish the operation in five or six minutes; but twenty minutes elapsed before the dressing was complete, and during all this time Dr. Crane kept the patient constantly under the influence of the gas. I presume this is the longest time that any one has as yet been kept under its influence. The operation was done in the presence of Sir Joseph Olliffe, Dr. Dyce Duckworth of London, Dr. Schost (late of the U.S. Army), Dr. Thierry-Mieg, and Dr. Pratt. They were all satisfied with the effects of the gas. Dr. Duckworth examined the tumour microscopically, and pronounced it cancerous.

If a patient can be safely kept under the influence of nitrous oxide gas for twenty minutes, I see no reason why not for an hour or more. It is, I am sure, to be the great anæsthetic for ovariotomy, simply because it is never followed by nausea and vomiting. I think it ought to drive chloroform in a great measure from the operating theatres of our hospitals, for it is certainly a safer agent. At first sight it would seem to be very troublesome to make the gas, and to keep an abundant supply always on hand. But this is not so. Almost all the American dentists in Paris have apparatus for making it. Dr. Crane was the first to use it here. He has been using it four years; Dr. Preterre for more than two years. Then come Dr. Parmly, Dr. Rottenstein, and Dr. Lond, and now it has received a new impetus under the hands of Dr. Evans and Dr. Colton. To Dr. Colton, and to him alone, belongs the credit of resuscitating and vulgarising its use; for after the death of the great discoverer of anæsthesia, the lamented Horace Wells, it had fallen into entire disuse, till Dr. Colton placed it where it now stands as the special anæsthetic of the dental art. Dr. Colton has given this gas more than twenty-five thousand times without an accident.

Dr. Crane informs me that a complete apparatus, capable of containing 700 *litres* of gas, will cost only 200 *francs*, all ready for use; and that 600 *litres* of gas can be made at a cost of about three *francs*, the nitrate of ammonia, which is the most expensive ingredient, costing half a *franc* per pound. Thus, on the score of economy, it is really cheaper than the best Scotch chloroform, while it is safer than any anæsthetic yet introduced. I see no reason why every hospital should not have its own nitrous oxide gas factory always ready for any emergency.

Dr. Colton says that the gas should be made at short intervals for use. Dr. Crane says that by keeping the gas there is a waste; but that it is as safe to give it when a month old as when newly made.

We may sometimes fail in giving the nitrous oxide gas. About a year ago, Dr. Parmly gave it to a patient of mine with fissure of the anus, who complained that the anæsthetic intensified the pain of the operation, and she would on no account submit again to its administration. She passed from its influence rapidly, but in a most excited state of mind. This was, of course, because we did not give enough of the gas before we began the operation.

Two weeks ago, Dr. Evans attempted to give the gas to a patient for me, where it was necessary to remove a small fibroid tumour from the cavity of the cervix uteri. He made two attempts, and failed, simply because of the great nervous excitability of the patient, and the excessive dread she had of being rendered insensible. The same thing would, in all probability, have happened if we had given chloroform. Dr. Evans felt sure that he could have succeeded with the gas if he had been permitted to go on. However, we gave it up; and, two days later, this lady, who was afraid to breathe the gas, had the moral courage to submit to the operation without the aid of any anæsthetic whatever. On both occasions Sir Joseph Olliffe, Dr. Pratt, and Dr. Vivier, were present.

In January last, Dr. Colton gave the gas to a nervous hysterical patient of mine, who had had a hysterical cough for three or four weeks, which could not possibly be controlled by any medication. I think the gas produced a temporary amelioration of this most painful affection; but the patient unfortunately took such a disgust to the whole method of administration, that we could not prevail upon her to try it again. Dr. Colton wished to give the gas regularly three or four times in the twenty-four hours. He relates many cases of neuralgia cured by the gas; and he thinks it may be given in many nervous diseases, not only as an anæsthetic, but as an essentially curative agent. There are some drawbacks to its general use. 1st. It is very bulky; it required 50 *litres* for the operation of twenty minutes. Thus, an operation of an hour's duration would require the enormous bulk of 150 *litres*. The India-rubber bag, containing 50 *litres*, is three feet square. In operations requiring profound sleep and perfect relaxation of the muscular system, I do not think the nitrous oxide gas could take the place of chloroform; however, it will take but a short time to settle its merits in London, where there is every opportunity for experiment, and every incitive to investigation; and that, too, by philosophic observers full of scientific knowledge.

Faubourg St. Honoré, Paris, April 6th, 1868.

Note on the use of the Protoxide of Nitrogen in the Operation performed by Dr. Sims on the 2nd of April, 1868.

Pulse before the operation, 90. From the beginning to the end, and all through the inhaling process, the quickness of the pulse did not change. After one minute and a half from the beginning, a slight excitement in the muscles of the arms took place; sudden contractions; but they did not keep on, and after one minute longer they had ceased. After four minutes from the beginning we tried to lift the arms up; they did not fall down by their own weight as heavily as they do under the influence of chloroform or ether; but as the patient seemed to have lost consciousness, and had very deep and equal inspirations, and reacted very little against the prick of a pin, the operation was begun. Whenever Dr. Sims made a new incision of the skin, the patient had some groanings, though unconscious. She had also contractions of the arms, and it was necessary to have them held by two persons all the time; nevertheless, she was quiet enough to let the doctor perform the operation as well as if she was under the deepest influence of chloroform or ether.

A quarter of an hour after the beginning of the first inhalations, we began to notice that the pulse, though keeping to 90, was a little weaker; and five minutes later we found it weak enough to think it was prudent to stop. This we did; the patient woke up after half a minute, and the three last stitches were done whilst she was conscious again. The pulse got its natural strength at once. The patient did not feel the slightest headache, nor nausea, nor weakness.

My personal impression about the weakness of the pulse after fifteen minutes from the time the inhalation had begun, is that the admission of nitrous oxygen gas was not free enough. It was inhaled through the mouth only, the nostrils being pinched. I think that, for such a long process of inhalation, *the nostrils also ought to be covered by the inhaling apparatus*. The patient had not been allowed once, during the whole time, to inhale atmospheric air; and the admittance of nitrous oxyde did not seem to me free enough for such a long time, as the bag was placed one yard lower than the patient's mouth (though the gas is one and a-half times heavier than atmospheric air), and several times the tube communicating from the bag to the patient's mouth had bent and formed a right angle, which diminished the free admission of the gas.

I therefore think that, by taking the necessary measures to prevent these little inconveniences, viz., by giving very free admission to the gas through the mouth and nostrils, we should have prevented the weakness of the pulse which occurred after fifteen minutes and made us stop from prudence after twenty minutes' inhalation; and I do not see why we should not have been able to continue the inhalations for any length of time.

DR. THIERRY-MIEG.

Paris, April 6, 1868.

REPORTS
OF
MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS OF GREAT BRITAIN.

NORTHAMPTON GENERAL INFIRMARY.

A CASE OF SUCCESSFUL OPERATION FOR FISSURE OF THE PALATE IN AN INFANT SIX MONTHS OLD.

By FRANK BUSZARD, Esq., House-Surgeon.

E. J., an infant, aged 4 months, was first brought to the Northampton Infirmary as an out-patient in October 1867, and was under the care of Mr. Mash, who kindly permitted me to conduct the treatment. The child was suffering from a very wide hare-lip on the left side, and a cleft extending completely through both hard and soft palates; and, in consequence of the difficulty as to feeding it, presented a miserably thin and puny appearance. The hare-lip was operated on successfully in the ordinary manner, and in a few weeks the child became much improved in appearance, as more nourishment was able to be swallowed, though much still was returned by the nostrils.

On the 15th of December, the child was admitted an in-patient that an attempt might be made to close the soft palate by operation, and this was effected on December 19. Chloroform was given at first, but omitted during the later stages, which were tedious. The mouth was kept open by a gag, and the tongue depressed by the ordinary spatula. No difficulty was experienced in dividing the muscles by puncturing the soft palate from the front close to the annular process on each side, or in paring the edges of the fissure; but, in consequence of the small size of the mouth, the difficulty in selecting a needle sufficiently curved and not too long, the process of introducing the sutures and drawing them tight was tedious in the extreme. Ordinary curved needles held in Millikin's forceps were employed. Three sutures were put in, and, when they were drawn tight, a complete closure of the fissure in the soft palate was effected. Bleeding was not profuse, and was easily arrested by sponging with iced water. The child rallied well from the operation, slept most of the day, and took its usual quantity of milk, swallowing very much better than before. To avoid any danger of laceration of the tissues during screaming, no examination of the mouth was made